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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/594,273	07/24/2007	Tetsuzo Miki	296975US0X PCT	3412
22850	7590	08/18/2011	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P. 1940 DUKE STREET ALEXANDRIA, VA 22314			CROUSE, BRETT ALAN	
ART UNIT		PAPER NUMBER		
1786				
NOTIFICATION DATE		DELIVERY MODE		
08/18/2011		ELECTRONIC		

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/594,273

Filing Date: July 24, 2007

Appellant(s): MIKI ET AL.

Richard L. Treanor
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11 July 2011 appealing from the Office action mailed 29 November 2010.

(1) Real Party in Interest

The examiner has no comment on the statement, or lack of statement, identifying by name the real party in interest in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The following is a list of claims that are rejected and pending in the application:

Claims 1-27 are pending in the application.

Claims 1-27 are rejected.

(4) Status of Amendments After Final

The examiner has no comment on the appellant's statement of the status of amendments after final rejection contained in the brief.

(5) Summary of Claimed Subject Matter

The examiner has no comment on the summary of claimed subject matter contained in the brief.

(6) Grounds of Rejection to be Reviewed on Appeal

The examiner has no comment on the appellant's statement of the grounds of rejection to be reviewed on appeal. Every ground of rejection set forth in the Office action from which the appeal is taken (as modified by any advisory actions) is being maintained by the examiner except for the grounds of rejection (if any) listed under the subheading "WITHDRAWN REJECTIONS." New grounds of rejection (if any) are provided under the subheading "NEW GROUNDS OF REJECTION."

(7) Claims Appendix

The examiner has no comment on the copy of the appealed claims contained in the Appendix to the appellant's brief.

(8) Evidence Relied Upon

2005/0074632	Lee et al.	04-2005
7,227,027	Qiu et al.	6-2007
JP 2002-008860	Sato et al.	1-2002

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

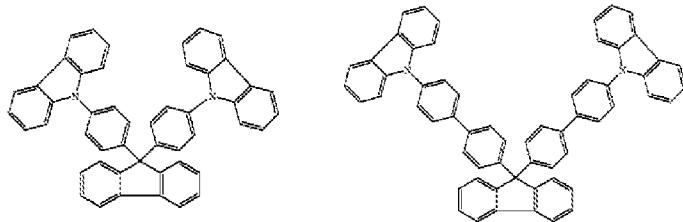
Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19, 20, 22, 24, 25, 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Qiu et al., US 7,227,027.

Qiu teaches:

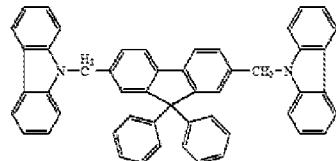
Column 5, line 14 through column 6, line 23, formula (III), teaches carbazole derivatives of formula (III). Column 6, lines 3-5, teach that R¹ through R¹⁶ are independently selected from hydrogen, alkyl, alkoxy, aromatic, fluoroalkyl, halogen and cyanic groups. Column 6, lines 9-29, teach the spiro group can be further substituted with alkyl groups, aromatic groups and halogens.

Column 6, lines 24-29, teach an electroluminescent device comprising the compound of formula (III) and a triplet emissive dopant in the emissive layer.

Columns 13/14, provide exemplified compounds of formula (III). Compounds (28) and (29) are shown below.



Columns 9/10, provide exemplified compounds of formula (III). Compound (14) is shown below.



Qiu does not provide an example compound comprising a substituted spiro group.

Qiu is silent as to the definition of the spiro group.

Qiu does not provide a compound having three or four carbazole groups.

It would have been obvious to one of ordinary skill in the art to provide the spiro group of formula (III) of Qiu with the recited substituents and to use the resulting compounds in the device of Qiu with the expectation that the compounds within the scope of formula (III) would function suitably in the device of Qiu as taught by Qiu.

It would have been obvious to one of ordinary skill in the art to use the substituted or unsubstituted C6 to C50 aromatic group for the spiro group of formula (III) based on the similar/parallel use of phenyl groups for the aromatic groups of formula (III) with the expectation that aromatic groups finding utility at other locations in the compound would provide similar utility as the spiro group.

It would have been obvious to one of ordinary skill in the art to make a fluorene derivative compound having 3 or 4 carbazole - Ar substituents and use the compound in the device of Qui with the expectation that a compound formed as a composite of the exemplified groups of Qiu and attachment points of Qiu would find similar utility to the groups of formula (III) of Qiu due to the similar selection of groups and skeletal structure.

Claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 13, 16, 17, 18, 19, 20, 24 and 27 are rejected under 35

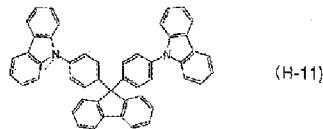
U.S.C. 103(a) as being unpatentable over Sato et al., JP 2002-008860.

Sato teaches:

Claims 1, 3, 4, 5, teach a composition of a carbazole derivative of formulae (II) and (II') in combination with metal containing compounds in the light emitting layer of an electroluminescent device.

Paragraph [0030], teaches the substituents represented by $R^7 - R^{18}$ can be independently selected from groups including hydrogen, halogen, alkyl, aralkyl, cyano, aromatic hydrocarbons and aromatic heterocycles.

Paragraph [0049], provides exemplified compounds of formula (II'). Attention is directed to compound (H-11), shown below.



Paragraph [0048], compound (H-3), provides an example compound in which the phenyl groups of formula (II') are substituted with methyl (alkyl) groups.

Paragraphs [0056]-[0057], provide exemplified metal containing compounds of formula (IV).

Paragraphs [0083], [0091], teach as part of the working examples the inclusion of phosphorescent dopants into a light emitting layer which further comprises a compound of the formula (II).

Claims 1, 2, 3, 4, 5, 6, 7, 8, 10, 12, 17, 18, 19, 21 and 23 are rejected under 35 U.S.C.

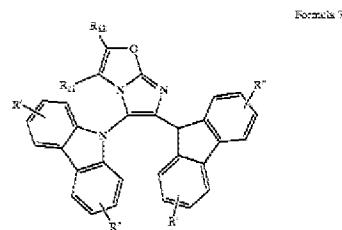
103(a) as being unpatentable over Lee et al., US 2005/0074632.

Lee teaches:

Paragraphs [0007]-[0013], formula 1, teach an imidazole derivative useful as a host material for a fluorescent or phosphorescent dopant of the light emitting layer of an electroluminescent device. Paragraph [0011], teaches the substituents R_1 through R_{12} can

be independently selected from groups including halogens, cyano, nitro, and substituted or unsubstituted alkyl, alkoxy, and aryl groups.

Paragraph [0032], formula 7, teaches an imidazole derivative comprising a substituted or unsubstituted carbazole and substituted or unsubstituted fluorene group. Formula 7 is reproduced below.



Paragraphs [0052]-[0060], figure 1, teach electroluminescent device structure and suitable component materials.

Lee does not provide an example compound comprising the recited substituents upon the imidazole ring.

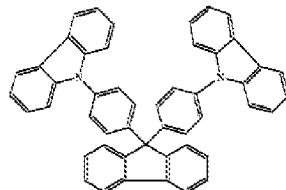
It would have been obvious to one of ordinary skill in the art to provide the imidazole ring of Lee with one or more of the substituents of Lee and use the resulting compound in the device of Lee with the expectation that the compound would provide the device with suitable light emitting host properties as suggested by Lee.

(10) Response to Argument

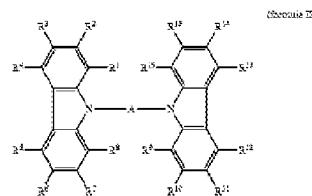
Appellant argues with respect to Qiu that Qiu does not provide a *prima facie* case of obviousness because the references do not provide an exemplified example compound with the instant claims. Appellant additionally argues that the subgenus claimed in the instant invention

should not be rejected solely by the generic disclosure of the applied references which encompasses the compounds of the instant claims. The examiner disagrees.

The scope of the instant claims requires Ar to be selected from an aromatic hydrocarbon group or aromatic heterocyclic group. Qiu teaches the linking group of formula (III) can be various substituted and unsubstituted aromatic groups. Qiu provides as compound (28), shown below, compound (2) exemplified in the instant specification on page 9.



The scope of the instant claims requires the substituent to Ar to be selected from fluorine, chlorine, cyano, nitro, alkyl, alkoxy, trifluoromethyl, phenyl, tolyl, naphthyl and aralkyl. Qiu similarly teaches the central group of formula (III), shown below, can be further substituted with alkyl, aromatic, and halogen substituents in column 6, lines 22-23. Qiu additionally provides exemplified compounds comprising alkyl substituents, such as compounds (3), (12), and (13) and aromatic (phenyl) substituents, such as compound (7). There is a high degree of overlap between the substituent groups of Qiu and the substituent groups of the instant claims. This is not a case of a genus rejecting a species as argued by appellant. This is a case in which Qiu clearly teaches a high degree of overlap of groups and uses the compounds in the manner as contemplated by appellant.



It is additionally noted that appellant only presents one compound, compound (3) of page 9 of the instant specification and current instant claims 16 and 27 within the scope of the instant claims. Appellant relies on the same level of generic disclosure having closely matching scope to that of the prior art.

Appellant additionally argues unexpected results and includes material properties in support of the argument.

Appellant should compare its claimed invention with the “closest prior art.” *In re Baxter Travenol Lab.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) (when unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art).

Compound (2) and (3) of the instant specification, CDPF and CDMPF, possess similar properties. The ionization potential differs between the compounds by 0.04 eV and accounting for the band gap the electron affinity differs by only 0.01 eV. The prior art teaches CDPF explicitly and suggests alkyl substituents to the compound skeleton. Qiu in the exemplified compounds beginning in column 6 provide methyl substituents to the phenyl linking groups of the carbazole derivatives. Both the exemplified CDPF compound of the prior art reference Qiu and CDMPF compound of the instant specification are shown to be suitable for use in the electroluminescent arts. The properties of the materials as they relate to device performance are related to the environment in which they are used in conjunction with the other materials of an electroluminescent device. As such, there is no showing as to the combination of materials used in conjunction with CDMPF that would provide unexpected device performance opposite the closest prior art.

Appellant's showing is not commensurate in scope with the scope of the claims.

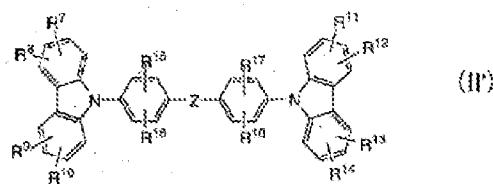
Appellant provides one compound, compound (3), within the scope of the claims and argues that compounds of formula (1) comprising any aromatic hydrocarbon group or any aromatic heterocyclic group having the recited substituents provides unexpected results. The breadth of possible groups for Ar of instant formula (1) encompasses groups having widely varying and distinct electronic properties. There is no showing that these groups having distinct and divergent properties provide unexpected results over the closest prior art.

Additionally, the instant claims do not limit the number and position of the substituents upon the Ar group. The recited substituents of the instant claims encompass substituents which impart divergent electronic properties to the Ar group. For example, one of ordinary skill in the art would not expect a group such as the methyl group exemplified by appellant to impart the same properties as a halogen to the Ar group. As such there is no showing commensurate with the scope of the claims to support unexpected results across the breadth, number, and position of substituents upon the Ar group.

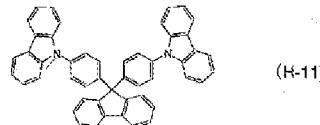
Appellant argues with respect to Sato that Sato does not provide a *prima facie* case of obviousness because the references do not provide an exemplified example compound with the instant claims. Appellant additionally argues that the subgenus claimed in the instant invention should not be rejected solely by the generic disclosure of the applied references which encompasses the compounds of the instant claims.

The scope of the instant claims requires Ar to be selected from an aromatic hydrocarbon group or aromatic heterocyclic group. Sato teaches the linking group of formula (II') can comprise various substituted and unsubstituted conjugated groups.

The scope of the instant claims requires the substituent to Ar to be selected from fluorine, chlorine, cyano, nitro, alkyl, alkoxy, trifluoromethyl, phenyl, tolyl, naphthyl and aralkyl. Sato teaches in paragraph [0030], the substituents represented by $R^7 - R^{18}$ of formula (II'), shown below, can be independently selected from groups including hydrogen, halogen, alkyl, aralkyl, cyano, aromatic hydrocarbons and aromatic heterocycles.



Sato also provides compound H-11, shown below as an exemplified compound of formula (II') and is exemplified in the instant specification as compound (2) on page 9.



There is a high degree of overlap between the substituent groups of Sato and the substituent groups of the instant claims. This is not a case of a genus rejecting a species as argued by appellant. This is a case in which Sato clearly teaches a high degree of overlap of groups and uses the compounds in the manner as contemplated by appellant.

It is additionally noted that appellant only presents one compound, compound (3) of page 9 of the instant specification and current instant claims 16 and 27 within the scope of the instant

claims. Appellant relies on the same level of generic disclosure having closely matching scope to that of the prior art.

Appellant additionally argues unexpected results and includes material properties in support of the argument.

Appellant should compare its claimed invention with the “closest prior art.” *In re Baxter Travenol Lab.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) (when unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art).

Compound (2) and (3) of the instant specification, CDPF and CDMPF, possess similar properties. The ionization potential differs between the compounds by 0.04 eV and accounting for the band gap the electron affinity differs by only 0.01 eV. The prior art teaches CDPF explicitly and teaches various substituents within the scope of the instant claims to the compound skeleton. Both the exemplified CDPF compound of the prior art Sato reference and CDMPF compound of the instant specification are shown to be suitable for use in the electroluminescent arts. The properties of the materials as they relate to device performance are related to the environment in which they are used in conjunction with the other materials of an electroluminescent device. As such, there is no showing as to the combination of materials used in conjunction with CDMPF that would provide unexpected device performance opposite the closest prior art.

Appellant’s showing is not commensurate in scope with the scope of the claims. Appellant provides one compound, compound (3), within the scope of the claims and argues that compounds of formula (1) comprising any aromatic hydrocarbon group or any aromatic

heterocyclic group having the recited substituents provides unexpected results. The breadth of possible groups for Ar of instant formula (1) encompasses groups having widely varying and distinct electronic properties. There is no showing that these groups having distinct and divergent properties provide unexpected results over the closest prior art.

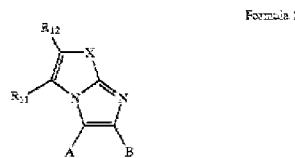
Additionally, the instant claims do not limit the number and position of the substituents upon the Ar group. The recited substituents of the instant claims encompass substituents which impart divergent electronic properties to the Ar group. For example, one of ordinary skill in the art would not expect a group such as the methyl group exemplified by appellant to impart the same properties as a halogen to the Ar group. As such there is no showing commensurate with the scope of the claims to support unexpected results across the breadth, number, and position of substituents upon the Ar group.

Appellant argues with respect to the rejection over Lee that the reference does not provide a *prima facie* case of obviousness because the reference does not provide an exemplified example compound with the instant claims. Appellant additionally argues that the subgenus claimed in the instant invention should not be rejected solely by the generic disclosure of the applied reference which encompasses the compounds of the instant claims. Appellant points to paragraph [0033] and formula (7) of Lee as teaching away from the claimed invention of the instant application.

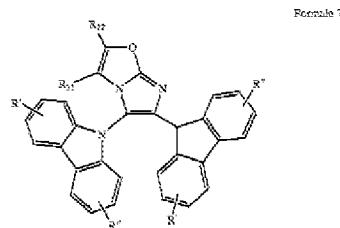
Appellant is reminded that a reference is prior art for all it teaches.

The description of paragraph [0033] is a preferred embodiment of Lee in which R11 and R12 combine to form further fused rings. The teachings of Lee encompass a broader scope of

compounds than that which is recited in paragraph [0033]. The scope of the instant claims requires the substituent to Ar to be selected from fluorine, chlorine, cyano, nitro, alkyl, alkoxy, trifluoromethyl, phenyl, tolyl, naphthyl and aralkyl. Attention is directed to paragraph [0011] which, with regard to formula 1, shown below, teaches each of R11 and R12 can be groups including alkyl, alkoxy, aryl, cyano, nitro and halogen. Paragraph [0011] teaches that R11 and R12 can optionally combine to form further substituted or unsubstituted rings. Attention is also directed to paragraph [0026] which teaches the substituents to the further rings formed by the combination of R11 and R12. The substituents to rings include various aryl and heteroaryl groups. Phenyl and naphthyl groups are exemplified as substituents.



Formula (7), shown below, provides an exemplified compound in which A and B of formula (1) are selected as carbazole and fluorene respectively.



It is additionally noted that appellant only presents one compound, compound (3) of page 9 of the instant specification and current instant claims 16 and 27 within the scope of the instant claims. Appellant relies on the same level of generic disclosure having closely matching scope to that of the prior art.

Appellant additionally argues unexpected results and includes material properties in support of the argument.

Appellant should compare its claimed invention with the “closest prior art.” *In re Baxter Travenol Lab.*, 952 F.2d 388, 392, 21 USPQ2d 1281, 1285 (Fed. Cir. 1991) (when unexpected results are used as evidence of nonobviousness, the results must be shown to be unexpected compared with the closest prior art).

Compound (2) and (3) of the instant specification, CDPF and CDMPF, possess similar properties. The ionization potential differs between the compounds by 0.04 eV and accounting for the band gap the electron affinity differs by only 0.01 eV. The properties of the materials as they relate to device performance are related to the environment in which they are used in conjunction with the other materials of an electroluminescent device. Appellant has provided no showing as to the properties of the exemplified compound opposite the compounds of Lee. As such, there is no showing as to the combination of materials used in conjunction with CDMPF that would provide unexpected device performance opposite the closest prior art.

Appellant’s showing is not commensurate in scope with the scope of the claims. Appellant provides one compound, compound (3), within the scope of the claims and argues that compounds of formula (1) comprising any aromatic hydrocarbon group or any aromatic heterocyclic group having the recited substituents provides unexpected results. The breadth of possible groups for Ar of instant formula (1) encompasses groups having widely varying and distinct electronic properties. There is no showing that these groups having distinct and divergent properties provide unexpected results over the closest prior art.

Additionally, the instant claims do not limit the number and position of the substituents upon the Ar group. The recited substituents of the instant claims encompass substituents which impart divergent electronic properties to the Ar group. For example, one of ordinary skill in the art would not expect a group such as the methyl group exemplified by appellant to impart the same properties as a halogen to the Ar group. As such there is no showing commensurate with the scope of the claims to support unexpected results across the breadth, number, and position of substituents upon the Ar group.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/BRETT A. CROUSE/

Examiner, Art Unit 1786

Conferees:

/Jennifer A Chriss/

Supervisory Patent Examiner, Art Unit 1786

/D. Lawrence Tarazano/

Supervisory Patent Examiner, Art Unit 1781